

REMARKS/ARGUMENTS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office Action, and the following remarks are presented for the Examiner's consideration.

Claims 94-111 and 114-157 were rejected under 35 USC 103(a) as being unpatentable over Sherman (US 2,320,754) in view of Bettinzoli (US 2006/0121402). Traversal of this rejection is made for at least the following reasons. Neither Sherman nor Bettinzoli disclose, teach, or suggest a gas burner having a distributor means consisting of three distribution chambers, each distribution chamber having three distribution channels having a substantially T configuration, and each distribution channel including a plurality of flame ports through which the gas mixture can pass and be ignited. Having the number of inwardly extending arms of the gas burner be limited to three means that the flame ports can be more uniformly distributed around the distribution channels, as seen in Figure 5. The flame port spacing is important to obtain uniform heating.

Sherman discloses a gas burner with four chambers. Moreover, Sherman has no flame ports on the circular portion of the distributor joining the bases of the four inward projecting arms. With four chambers having inward projections as shown in Sherman, there are no inward-facing flame ports along the periphery joining the bases of the inward projections of the burner. The flame ports are confined to the inward projection 53. This is because four inward projections produces crowding of the combustion areas adjacent the flame ports, so the flames would interfere, possibly resulting in incomplete combustion and producing toxic combustion products. In contrast, the flame ports of the claimed invention include spacing with significantly less variation. Accordingly, the provision of three "T" shaped combustion chambers is an inventive change in relation to Sherman.

The examiner contends that Sherman does show "T" shaped chambers and then goes on to state that Bettinzoli shows an arrangement in which each distribution chamber has an injector. This is an example of a four terms fallacy. However, the examiner is now referring to a different object in referring to the "distribution chambers" of Bettinzoli compared with the "T" shaped chamber of the present claim, or what the examiner has equated with a "T" shaped chamber in

Sherman. In Bettinzoli, there are two “T” shaped chambers each in communication with another two half “T” shaped chambers, so that each venturi feeds two “T” shaped chambers. Alternatively, it could be said that Bettinzoli has two “W” shaped chambers. Thus Bettinzoli does not show one venturi per “T” shaped chamber.

The shape of the chambers is significant as it influences the flow of primary gas/air to the flame ports. Thus, in Bettinzoli, the gas/air delivered to the flame ports in the two half ports on either extremity has lower flow rate than those delivered to the central portion of the chamber.

Accordingly, either Bettinzoli has four “T” shaped chambers with two venturis, or Bettinzoli has two “W” shaped chambers with two venturis. In either case, the flow of gas to the end half “T” chambers or to the ends of the “W” chambers will be reduced compared with the central “T” portion of the chamber.

The flame ports of Bettinzoli are shown as having significant spacing variation. Bettinzoli has varied flame port spacing, having only one flame port at the base of the inward projection of the end portions. Thus, the arrangement of Bettinzoli will have flame pattern which has substantial variation compared with the flame pattern of Figure 5 of the present application.

Accordingly, the combination of Bettinzoli with Sherman results in a distributor with four “T” shaped chambers, and the consequent non-uniformity of flame port distribution. The combination of these documents does not disclose or suggest a distributor with three “T” shaped chambers.

The examiner also states that Bettinzoli discloses “at least four venturis, and teaches that each are positioned to inject gas to each chamber”. This statement is not correct. The examiner does not cite any support for this statement based on the description of Bettinzoli to the effect that there are four venturis. In addition to the four terms fallacy discussed above in relation to the definition of chambers, there are only two venturis disclosed in Bettinzoli. As seen in Figure 2, a first venturi of Bettinzoli is defined by 11 with 12 and a second venturi is defined by 13 with 14.

Bettinzoli does not teach an arrangement which could be combined with Sherman to arrive at the present claims. Adding Bettinzoli to Sherman does not teach or suggest the feature of three “T” shaped chambers.

Bettinzoli teaches away from the present claims in that it is specifically addressed to the multiple ring arrangement having a central ring-shaped distributor and a peripheral distributor. Bettinzoli discloses a burner with a central ring burner and a double-sided peripheral burner in a clover-leaf shape and is directed to addressing problems peculiar to such an arrangement.

Bettinzoli teaches away from the present claims because the problems which Bettinzoli addresses do not arise in the single burner arrangements of the present claims. In Bettinzoli, the inward projections of the peripheral burner do not have flame ports directed inwards proximate the inner ends of the projections. There is a very good reason for this. If the flames from the inward projections and the flames from the ring burner were to overlap or rob oxygen from one another, there would be a risk of incomplete combustion, and toxic gasses would be released.

- First Point of Differentiation – Three “T” shaped chambers v Four “T” shaped chambers

In relation to Item 7 of the Office action, claim 1 has been amended to limit the number of “T” shaped chambers to three. This is an inventive differentiation between the claimed claims and the combination of Sherman with Bettinzoli, neither of which disclose or suggest three “T” shaped chambers.

This is an important differentiation, as is illustrated by the flame port distribution. The flame ports of Sherman are shown as having significant spacing variation. In contrast, the claimed flame ports have spacing with significantly less variation. The flame port spacing is important to obtain uniform heating. With four chambers having inward projections as shown in Sherman, there are no inward-facing flame ports along the periphery joining the bases of the inward projections of the burner. The flame ports are confined to the inward projection 53. This is because four inward projections produces crowding of the combustion areas adjacent the flame ports, so the flames would interfere, possibly resulting in incomplete combustion and producing toxic combustion products.

Bettinzoli also has four “T” shaped chambers or two “W” shaped chambers, and also has varied flame port spacing, having only one flame port at the base alternate inward projections. A

further way to look at Bettinzoli is that it has four or six inward projections – six resulting from counting the half projections as individual projections. In any event, Bettinzoli has only two venturis delivering gas to the chambers.

Accordingly, the provision of three “T” shaped combustion chamber is an inventive change in relation to the combination of Sherman and Bettinzoli.

- Second point of differentiation – One venturi/injector per “T” shaped chamber

The examiner also asserts that Bettinzoli discloses one “at least one injector (11) associated with each of said distribution chambers”. However, this is an example of the four terms fallacy. The examiner is now referring to a different object in referring to the “distribution chambers” of Bettinzoli compared with the “T” shaped chamber of the present claim, or what the examiner has equated with a “T” shaped chamber in Sherman. In Bettinzoli, there are four “T” shaped chambers, but only two injectors. Thus Bettinzoli does not show one injector per “T” shaped chamber.

Thus, in Bettinzoli, the primary gas/air mixture must flow from the “T” shaped chambers with a venturi to the adjacent “T” shaped chambers which do not have venturis. This will result in lower available pressure and flow out of the flame ports in the chambers without venturis than in those with venturis. This results in uneven heating.

Sherman has only one eccentric point of gas supply for the four “T” shaped chambers, and will also result in unequal flame port supply.

Accordingly, the provision of one venturi per “T” shaped chamber is an inventive difference between the present claims and the combination of Sherman with Bettinzoli.

The examiner states “In view of Bettinzoli, there is an injector for each chamber as claimed. It would have been obvious to have a venturi system for each chamber because the technique was known in the art...” Applicants disagree. The examiner has not cited any instance of three “T” shaped chambers, each with a venturi. The only examples the examiner has cited are of four “T” shaped chambers with one inlet for all four chambers (Sherman), or four chambers with two venturis for the four chambers (Bettinzoli).

If Bettinzoli is considered as having two “W” shaped chambers, then there is one venturi per chamber. However, the difference between a “T” shaped chamber and a “W” shaped chamber is the decrease in gas flow in the end portions of the “W” shaped chamber compared with the “T” shaped chamber of the present claims.

- Third Point of Differentiation – Upwardly directed venturi passage

Bettinzoli expressly excludes the upward passage as being part of the venturi system [0036].

Claims 112, 113, and 158-164 were rejected under 35 USC 103(a) as being unpatentable over Sherman (‘754) in view of Bettinzoli (‘402) and further in view of Haynes et al. (US 6,439,882). Traversal of this rejection is requested for at least the following reasons.

Claims 112 and 113 depend from claim 94, which is believed to be allowable over the combination of Sherman and Bettinzoli for the reasons discussed above. Haynes does not make up for these aforementioned deficiencies of Sherman and Bettinzoli. Haynes relates to a burner with outwardly directed flame ports. Haynes discloses a single venturi feeding a “Y” shaped chamber with outwardly directed projections and flame ports. Haynes does not disclose three “T” shaped chambers. Haynes does not disclose three “T” shaped chambers having one venturi per chamber. Thus, it is believed that claims 112 and 113 are allowable over the combination of Sherman, Bettinzoli, and Haynes.

Regarding claims 158-164, each of these claims require that each chamber includes one venturi. The Examiner relies on Bettinzoli to disclose this feature. However, as disclosed in detail above, Bettinzoli does not disclose the injector/chamber ratio of 1:1. For these reasons, the combination of Sherman, Bettinzoli, and Haynes fails to render claims 158-164 obvious. Withdrawal of this rejection is requested.

In consideration of the foregoing analysis, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is

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determined that the application is not in a condition for allowance, the examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application. If there are any fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. ABE-40943.

Respectfully submitted,
PEARNE & GORDON LLP

By: /Una L. Lauricia/
Una L. Laurica, Reg. No. 48998

1801 East 9th Street, Ste 1200
Cleveland, Ohio 44114-3108
(216) 579-1700

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